

# Multiple Stressors: Interactions

## Summary Points - Canuel

- Stressor interactions may be additive, synergistic and antagonistic.
- As number of stressors increases, interactions become more complex and more synergistic.
- Stressor effects may differ for producer vs. consumer organisms
- Effects can extend beyond spatial and temporal scales of individual stressor, increasing potential for interactions with additional stressors.



# Multiple Stressors: Interactions Management Considerations

- Interaction type varies by response level (e.g., individual species, population, community, etc.)
  - structure management strategies around broad system properties such as diversity and maintenance of ecosystem services rather than individual species (*Palumbi, 2009, Front Ecol Env*)
  - diversity enhances a variety of ecological processes that enhance recovery, resistance, protection, recycling, etc
- Guiding principles for management (*Foley et al. in press, Marine Policy*):
  - Maintain native species diversity
  - Maintain habitat diversity and heterogeneity
  - Maintain populations of key species
  - Maintain connectivity